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Tractors and trucks on Louisiana rice farms, 1929 : with supplementary data on labor requirements

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Tractors and Trucks on Louisiana Rice Farms, 1929

(With Supplementary Data on Labor Requirements)

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Rice growing is one of the most highly mechanized types of farming in Southern agriculture. In Louisiana approximately fifty per cent of the tractors on farms are located in the four leading rice producing parishes of Acadia, Jefferson Davis, Vermilion and Calcasieu. According to the 1925 census there were about 1600 tractors on farms in these four parishes. Since 1925 tractor usage has increased in the rice area. Also, other types of farming are finding the new tractors better suited to their needs.

The intensive utilization of tractors and trucks in the rice area is made possible chiefly because of the high gross income per worker on rice farms. This fact is partly reflected in the higher wage rate prevailing there compared to nearby areas having different types of farming. When the outlay for man labor replaced is relatively high, a small number of workers replaced will result in a saving from wages sufficient to defray the expenses of owning and operating power machinery. Similar conditions in work stock replacement favored mechanical power usage.

The rice crop is well suited in its cultural requirements to the use of tractors. Some farmers use the tractor for every operation before the rice is flooded. Practically all the rice cutting is done with tractor power, and occasionally, if a long haul is involved, a farmer will use the tractor to haul bundle rice from the edge of the field to the thresher. The operations performed almost entirely by hand at the present time are shocking, pitching, sack sewing and dragging, and levee repairing. Attempts have been made to use the combine harvester in the rice area, but these have proven unsuccessful so far, due to moisture conditions in the rice grain, and the soil conditions at harvest time.[1] Repeated attempts will be made to introduce the combine as long as the price of rice

1 Agricultural Engineering Report, March, 1928.

encourages high labor incomes and the wage of labor remains at the present level. The use of a combine would increase further the volume of business which an individual operator could handle, providing he were able to make the necessary financial outlay.

Data giving the proportion of motor trucks used by rice farmers are not available. However, the rice growers are probably using a higher percentage of the farm trucks of Louisiana than of the tractors. Apparently most of the larger rice growers find it more profitable to own trucks than to depend upon contract trucks or horses for their hauling. Trucks are especially suited to rice farming conditions because of the large tonnage to be handled. Even some of the small rice growers contract to have their seed rice, fertilizer, and market rice hauled rather than go to the expense of using a team or purchasing an old motor truck. Commercially operated trucks for hauling market rice are active in the area at harvest time.

Since the use of mobile power equipment has played such an important part in rice farming, many problems have naturally arisen relative to the desirability and economy of types of equipment for farmers handling different volumes of business. Much adjustment has taken place in the selection of the equipment for a given capacity of business, but the farmers' power problem is one of hastening this adjustment as much as possible, whether in the power unit or in the business done.

AIM OF INVESTIGATION

A study of the power problem was undertaken as a part of a farm organization study in the rice area in 1929. The aim of this investigation was to secure facts on power utilization and make them available for rice farmers, so that they might hasten their adjustment in power usage, and be able to choose more wisely in their future selection of different types of power for their needs. The main emphasis was placed on tractors and their usage because that problem seemed to be more difficult for farmers to solve. Especially was this true of the smaller farm units, and those farms not satisfactorily suited to the use of power units now available. Adjusting the acreage of rice to meet the needs of the power unit may be more difficult than an adjustment in power units to handle most economically the acreage available.

Data were secured only from actual operators of power machinery whose livelihood was secured chiefly from the farms they were operating, and those likely to become such users in the near future. This was believed by the investigators to give the situation as rice growers experience it. Errors of estimate are inevitable in a study of this type, but tend to be compensating in most instances. The farmer is the only one qualified to give the information desired for this type of study. Improved technique on the farmer's part in order to improve his estimate will add to the applicability of such results as are presented here.

DATA USED

The subject matter of this report deals with the data obtained from 124 rice farmers for 1929. These farmers were located in Wards Three, Four and Six of Acadia and Jefferson Davis Parishes. On 115 farms there were 181 tractors in use. Data concerning individual tractors were secured insofar as this was possible from the records and memory of each operator. Occasionally, when more than one tractor was kept, this was impossible as the outlay had not always been kept separated. Many rice farmers keep records of their major items of outlay. This is required for the purpose of securing loans. Some farmers use this material in getting comparative data on methods and practices being followed.

The items of information concerning tractors consisted of their age, new cost, estimated present worth, amount and cost of fuel, amount and cost of lubricating oil and cup grease, repair parts and labor, insurance, and depreciation. Similar information was obtained for trucks and cars used for farm business purposes. These types of mobile equipment required additional items for mileage, license, tires and tubes, and accident insurance. The cash outlay items were considered more significant than items of depreciation and present worth. Important farm organization factors are related to the mobile power problem in this report. Judgment must be used in the interpretation of the data presented. Many explanatory details are intentionally omitted because the writers have assumed an understanding by the reader of the methods and practices in the rice area.

Data were collected on all farms, irrespective of the age, make, and rating of tractors used. A number of these were compara-

tively obsolete, such as the Fordson, Avery, Sampson, Rumley, and Minneapolis. Some of these tractors are not built at the present time. Others are still on the market but with new and more acceptable models. In most instances the farmers, now depending on these old tractors for all or part of their tractor power, are anxious to get information on other makes prior to purchasing a new tractor. They are seriously considering a change in the near future and desire to get that type of tractor which will best fit their organization. Such information as contained in this report, it is believed, will give them accurate estimates concerning outlays and accomplishments for particular makes of tractors now prominently used.

So far as each farmer is concerned a tractor becomes inadequate when it fails to do the most difficult task normally expected of it. That means, in most instances, the land preparation work. A certain amount of tractor replacement has taken place. Many of these old tractors were replaced for part of the operations before their entire mechanical usefulness was consumed. Yet each year they are used a few days for discing, drilling, dragging, binding, or threshing. They serve a need for a part of an extra power unit, if we may refer to tractors in that sense. For that purpose they add more to the farmer's earnings than would be possible without them or with a mechanically new and complete power unit. This problem will be further discussed under choice of tractor.

PROBLEMS OF TRACTOR USAGE

Since tractor usage is increasing and replacement must frequently be made, the question of the proper type and rating of tractor to fit the organization is the most important problem in this connection. Knowledge of technical operation of mobile power equipment should be advanced with increased power usage. In purchasing, the question of efficiency of different makes of tractors using the fuels available at certain prices should be considered. In operating the tractor, the economy of using different fuels at their relative prices, plus the effect of such usage upon rate of accomplishment and depreciation is most important. Two important problems are worthy of consideration, and the solution of these may bring some increase in family earnings. One is the adjustment to a larger sized unit for those farmers now operating less

than 100 acres of rice with a tractor; and the other is the improved usage of the tractor where a satisfactory acreage is maintained at present.

Farm land, classified as it is in the rice area, is in almost definite increases of forty acres and tends to group farms by quarter sections. This makes the farmers handle around 80 acres of rice, or 160, or 320, depending upon whether they own a quarter section, a half section, or a full section of land. The usual practice is to allow half of the land for rice to lay out each year. Since rice land either in use or resting actually occupies about 94 per cent of the total farm area, there is little opportunity to increase tractor usage if the rice area is too small. The best opportunity to increase the tractor usage is to rent additional rice land. If the rice area is too large, possibly land may be rented out temporarily. But the farmer finds it advisable to lose on his power utilization if he can more than make it up on his volume of business done.

Rice farmers should be acquainted with the mechanical operation of mobile power machinery. Next to business management, this problem is most important in getting low cost operation for the rice farmer. Investigations have shown beyond doubt that added usage and dependability of service are increased by adequate care in housing, greasing, and rate of operation. As a business fact, economies of this sort help the farmer by reducing the loss through unequal price levels for machinery bought and products sold, at a time when that spread appears to be decreasing.

While the above reference has been made to tractors and trucks, it is applicable to all the rice farm machinery. Other items such as binders, drills, grain separators, discs, and plows, have a high rate of depreciation which may be partially checked by careful handling. In the main such savings would be small, yet sufficient to justify some attention in management.

Problems of tractor usage and replacement will be considered in detail under the discussion of these particular phases. It is necessary to understand the particular farmer's problem when advising him what he should do in the light of experience of what other farmers are doing.

No partiality toward individual makes of tractors is intended in this report. The aim is to present the facts about tractor operation as the farmers interviewed have experienced them. If farmers

have expressed a preference, then it has been considered desirable to express the preference here, in order that others may know the facts. Any preference beyond that is left to the interpretation which each reader may gain after considering the data presented.

DISTRIBUTION OF TRACTORS

Only nine farmers of the group studied did not own a tractor. The others had from one to four. Farmers having three or four tractors usually had a large one for threshing and a small one for very light draw bar work. A distribution of the farms according to the number of tractors owned or operated is given in Table I.

TABLE I.

DISTRIBUTION OF FARMS STUDIED ACCORDING TO THE NUMBER OF TRACTORS USED, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Tractors per Farm	NUMBER OF FARMS		
	Acadia Parish	Jefferson Davis Parish	Total Farms
0	7	2	9
1	31	31	62
2	18	23	41
3	7	3	10
4	1	1	2
Total	64	60	124

TABLE II.

DISTRIBUTION OF FARMS STUDIED ACCORDING TO ACRES OF RICE PER FARM, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Acres of Rice per Farm	NUMBER OF FARMS		
	Acadia Parish	Jefferson Davis Parish	Total
0-100	20	2	22
101-200	20	31	51
201-300	14	15	29
301-over	10	12	22
Total	64	60	124

Half of the farmers in this study had one, and ninety per cent had one or two tractors. The tendency towards a larger sized farm power unit in Jefferson Davis Parish is in keeping with the larger acreage of rice per farm (Table II).

The rice growers have agreed fairly definitely on two particular makes of tractors, the McCormick-Deering and the John Deere.

The use of the Wallis and the Case is gaining more favor in the area. The tendency seems to be towards a more powerful tractor, partly for the purpose of avoiding contract threshing. The Fordson and McCormick-Deering 10-20 do not have adequate power for threshing rice under normal weather conditions. However, the 1929 harvest season was extremely favorable in respect to weather. Sometimes the power of two small tractors is used to operate the thresher. The larger tractors will pull a three bottom plow, the tandem disc and harrow at one operation, or supply adequate power for threshing.

A distribution of the tractors according to make and rating is presented for Acadia and Jefferson Davis Parishes in Table III. It is interesting to note the localization of the Fordson and the John Deere. The size of farm business in Acadia Parish has been too small to justify in many instances a power outlay other than the Fordson. If farmers operating these small units expect to continue, they may expect very low incomes and poorly adjusted power units for their businesses. While some light may be thrown on merits of different tractors, the farmer, after considering available information, must choose that one which meets his individual need. Sixty-three per cent of those on the farms studied were either McCormick-Deering or John Deere.

TABLE III.

DISTRIBUTION OF TRACTORS BY MAKES ON RICE FARMS, 1929.

Make of Tractor	NUMBER OF TRACTORS		
	Acadia Parish	Jefferson Davis Parish	Total
Fordson	20	5	25
McCormick-Deering 10-20	20	19	39
McCormick-Deering 15-30	16	16	32
John Deere 15-27	13	30	43
Hart-Parr*	7	0	7
Case*	8	3	11
Wallis*	3	8	11
Rumley*	3	5	8
Others*	1	4	5
Total	91	90	181

*Includes all sizes.

AGE AND ESTIMATED LIFE OF TRACTORS

The trend in the age distribution of tractors in use at a given time indicates in a general way the farmers' preference. It points to the adjustments which farmers are actually making in the size

and make of tractors used. The age distribution for the tractors on rice farms studied in 1929 is presented in Table IV. The age of all tractors was secured. Tractors used for handling any part of the 1929 crop were classed as one year old. Those over five years were classified in a single group. Some of the older tractors were purchased second hand, and the exact age was not known by the present owner. In other instances the owner was not certain as to the time of purchase. These tractors were not classified for age. It is certain that few of them were less than five years old.

Accurate determination of the length of life of any tractor could be secured by keeping a large number of detailed performance records. Approximating from farmers' estimates we get a fairly good picture of this situation and one adequate for this purpose. The number of hours of draw bar and belt work is the best measure of length of life. Farmers owning new tractors had a tendency to estimate the tractor life relatively low. Yet as the tractors increased in age, estimates of life were increased, evidently influenced by the possibilities of extending life through intensive repairing. Tractors of a 10-20 horse-power rating, at an average age of 1.9 years, were estimated to last 4.9 years at a total performance of 3,200 hours. Those tractors being operated at six years of age were estimated to last eight years, with a total performance of 4,200 hours. Tractors of a 15-27 or 15-30 rating, at an average of 1.5 years, were estimated to last 6.1 years at a total performance of 4,100 hours. The average life of similar sized tractors at 5.7

TABLE IV.

PER CENT DISTRIBUTION BY AGE OF TRACTORS, ACCORDING TO MAKE AND RATING, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Age of Tractors, Years	Make and Rating of Tractors					
	Fordson	McCormick-Deering 10–20	McCormick-Deering 15–30	John Deere 15–27	Other Tractors	Dominant Makes*
1	0	13	34	30	17	26
2	4	15	3	14	10	11
3	4	10	6	2	9	6
4	16	26	10	47	7	29
5	12	13	28	7	2	15
over 5	32	15	13	0	43	9
Not classified	32	8	6	0	12	4

*Includes McCormick-Deering 10-20, and 15-30, and John Deere 15-27.

years was estimated to be eight years, and the performance 5,400 hours. Only the outstanding makes have been included in these data.

Value depreciation tends to decrease with age and is highest during the first years of use. Conversely, repair outlays tend to increase at an increasing rate with age, at least until the main usefulness of the tractor is past. Outlays for repairs may more than offset depreciation, so the actual situation really combines original investment plus additions in the form of labor and parts throughout the life of the tractor.

Many of these old makes and models of tractors have remained in use on rice farms. A casual observer may comment on the cost of operating such obsolete equipment. Farmers buy tractors in years when the individual gross income from rice is largest. This means that considerable elasticity exists relative to the life of a tractor, because it can be repaired to run another season for a relatively smaller outlay than would be needed to make a new purchase. A new tractor is usually purchased before the entire mechanical usefulness of the old tractor disappears. These old tractors are used for very limited work long after they are unable to meet the demand of the heavier work, such as breaking. For these minor tasks the outlays are relatively economical, as we shall see in this discussion. The farmer makes his choice upon expected outlay to operate his old tractor as compared to the gross outlay for a new tractor to do about the same work.

Fuel and oil consumption may be higher for the old tractor than that required for a new machine of similar make and rating. Adequate power for performing all operations may be lacking. Little opportunity exists for keeping a sale price on second hand equipment. Sales agencies are always active in handling the new equipment. Thus, the resale opportunity is a negligible item in the farmer's calculation. Only current items of fuel, oil, repairs, and possible losses due to inefficiencies are involved. Due to the above conditions, such tractors successfully compete with the new tractors for certain operations, particularly on farms where the acreage of rice is poorly adjusted to a new power unit.

Old power units enable farmers to obtain a better adjustment when acreage is less flexible than tractor power. There are some farmers handling a rice acreage too large for one tractor and too

small to use two good tractors. The old tractors are retained because their services add more to net income than would be possible if new tractors were to replace them. A good adjustment is required in order to keep the overhead outlay reduced to the most economical point.

ACRES OF RICE HANDLED

Nine farmers did not own a tractor. The average acreage of rice handled by them was seventy-three, and the average number of work stock kept was six. Four of the operators not owning a tractor were land owners, and the others were share tenants. Three of these land owners hired a tractor to assist in the preparation of the land for rice. Farmers using tractors handled larger acreages of rice as the size of their power unit increased. The number of acres handled by specific power units is presented in Table V, together with the work stock kept. The number of work stock per farm is influenced very little by the acres of rice handled, though larger farmers find it convenient to own enough teams to avoid much exchange labor. This is more important if they own and

TABLE V.

AVERAGE ACREAGE OF RICE HANDLED AND WORK STOCK KEPT ON RICE FARMS ACCORDING TO POWER UNITS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Power Unit*	Number of Farms	Average Acres of Rice	Average Number of Work Stock
No Tractor	9	73	6.2
Fordson	9	100	5.1
McCormick-Deering 10-20	18	145	5.2
McCormick-Deering 15-30	10	213	8.0
John Deere 15-27	19	189	6.3

*Refers to farms using one tractor of the specified make and rating.

operate a threshing outfit. High land crops are cultivated almost entirely with work stock.

How well farmers have succeeded in getting the proper adjustment between power units and acres of rice may be seen in Table VI. This table indicates wide variations in the acres of rice handled by farmers using tractors of the same size. Obviously other influencing factors are essential in the organization obtained by each farmer at the present time. Some farmers are limited in land

area and must be content to spread their outlay for tractors over a longer period of time. Others have more acreage than they may normally need for their power, but they prefer to apply their outlay for tractors more intensively. The latter condition is generally considered desirable for economical operation, chiefly because of the influence upon overhead outlay.

HOW TRACTOR TIME IS SPENT

A consistent uniformity exists in the degree of diversity of tractor usage for total time and for particular operations. The performance remains relatively the same irrespective of the make and rating of the tractors. For example the smaller tractors tend to put in about the same proportion of time between rice and other things, and on various rice operations, as appears from the operations of larger tractors. Of course exception must be made for individual tractors that do no draw bar work, or are used for long periods at relifting.

Ninety-six per cent of the total tractor usage is directly for the rice crop of the tractor owner. In Jefferson Davis Parish the remainder of the tractor time was entirely for contract threshing, while in Acadia this usage was equally employed at contract threshing and land preparation for other crops.

TABLE VI.

NUMBER OF FARMS HAVING SPECIFIED ACREAGES OF RICE ACCORDING TO THE POWER UNIT USED, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Power Used*	Number of Farms Having This Acreage of Rice					
	0 to 125	126 to 175	176 to 225	226 to 275	276 and over	Total
No Tractor	8	1	0	0	0	9
Fordson	8	0	0	1	0	9
McCormick-Deering 10-20	8	7	2	0	1	18
McCormick-Deering 15-30	1	2	3	1	3	10
John Deere 15-27	3	7	4	3	2	19

*Refers to farms using one tractor of the specified make and rating.

The preparation of rice land for seeding requires about sixty per cent of the total tractor hours (Table VII). This consists of breaking the land, building the levees, discing, harrowing, and

rolling. About 25 per cent of the time is employed in cutting and threshing rice. Tractor usage in seeding consists of the operations of drilling rice, pushing up levees, and harrowing and rolling after drilling. During the rice growing season tractors are used on some farms to drive the air pressure pump of the Diesel engine pumping plant, or to lift water for irrigation purposes.

The tasks just mentioned consist of both draw bar and belt operations. The bulk of the tractor work in the rice section, it will be recalled, is at the draw bar. Belt work consists of relifting and of threshing. Minor belt operations such as fanning seed rice, sawing wood, and grinding feed are performed only occasionally and need no further consideration here. How tractors of different makes, on which actual usage could be obtained, were employed relative to draw bar and belt work is presented in Table VIII.

The major opportunity which most farmers have of increasing their tractor hours is in the replacement of contract threshing. Fifty per cent of the farmers interviewed in Acadia Parish contracted for their threshing power and thirty per cent did so in Jefferson Davis Parish. The hired tractor work amounted to 5.17 per cent, and 2.19 per cent of the total tractor hours in the respective parishes, and was practically all for rice threshing. At the usual rate for threshing, quite a saving may be made, to apply on tractor operation, when the regular farm tractor is used in cooperation with one or two neighbors to handle their threshing.

TABLE VII.

PERCENTAGE DISTRIBUTION OF TRACTOR HOURS BY CLASSES OF WORK ON RICE FARMS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Class of Work	–Per Cent of Total Tractor Hours– Acadia Parish	Jefferson Davis Parish
Rice Land Preparation	61.1	61.1
Rice Seeding	5.9	7.1
Rice Growing	5.3	1.0
Rice Harvesting	23.7	26.6
Other Crops	2.0	.3
Outside Contract Work	2.0	3.9
Total	100.0	100.0

TABLE VIII.

AVERAGE HOURS OF WORK, AND PER CENT OF TIME ON BELT WORK, BY MAKES AND SIZES OF TRACTORS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Make and Rating of Tractor	Number of Tractors*	Total Hours per Tractor	Hours of Belt Work	Per cent of Belt Work
Fordson	22	380	0	0
McCormick-Deering 10-20	27	625	22	4
McCormick-Deering 15-30	21	679	83	12
John Deere 15-27	34	708	70	10
Wallis†	11	531	32	6
Case†	8	514	117	23
Hart-Parr†	6	347	102	29
Rumley†	4	90	75	83

*Tractors used on relifts and some of the minor makes not included.
†Includes all sizes.

The prevailing rates in 1929 were as follows:

	Rate per bag
Operators, engine, thresher and lubricants	$ .15
Operators, engine, thresher, fuel, and lubricants	.175
Operator and thresher	.10
Entire crew, including delivery to warehouse	.35

Thus, the farmer operating 150 acres and getting the average yield per acre would have to make a total outlay of $250 for threshing, of which $90 might be used to apply on additional tractor outlay. Obviously, ownership of a thresher is important, but many instances may now be found where three or four farmers own a thresher in partnership.

Only five farmers used their tractors for relifting purposes as well as other farm work. When a large acreage of rice is flooded from a tractor relift, the number of hours per tractor is increased markedly. In order to show this intensive usage, Table IX is given. The farmer using a tractor 1,668 hours handled 250 acres of rice and flooded 125 acres of it with a tractor. The farmer using a tractor 568 hours used it to help out on 125 acres. It is evident from these instances that an increase of thirty to fifty per cent in tractor hours is possible by using the tractor on the relift. The total outlay is low, but drainage ditches are not a reliable source of water in dry years.

Tractor work on crops other than rice is a minor factor as practiced at the present time. This condition seems to prevail irrespective of the acreage of other crops grown. In a few instances farmers prepared the land for crops with a tractor or used

TABLE IX.

TOTAL TRACTOR HOURS, HOURS OF TRACTOR USE ON RELIFTS, AND OUTLAY FOR OPERATION, FIVE TRACTORS ON RICE FARMS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Make of Tractor	Total Hours Worked	Hours on Relifts	Outlay per 10 Hours— Operating	Overhead
McCormick-Deering 10-20.....	1,049	518	$2.21	$ .35
McCormick-Deering 15-30.....	568	168	4.48	3.79
McCormick-Deering 15-30.....	792	284	6.79	3.98
McCormick-Deering 15-30.....	1,668	1,165	3.40	1.30
John Deere 15-27.....	1,511	660	2.69	1.93

the tractor for putting in a legume hay crop. The difficulty is one of replacing sufficient men or teams permanently to justify the tractor. Except for the legume hay crop, the operations on other crops possible with a tractor all come at the time rice land is being prepared and planted. The rice enterprise gets first choice on all equipment, labor, and funds.

MEN AND MULES REPLACED BY TRACTORS

In order to determine the comparative situation with respect to tractor use, each farmer interviewed was asked how many men and mules were replaced by his tractor. This was intended to reflect the alternative situation with respect to competitive power. For comparative purposes only the data for certain tractors have been used. This comparison refers to the number of men and mules, though significant facts are found concerning the rate of working, seed bed preparation, and the number of operations required.

The estimated displacement by farmers using one power unit was as follows:

Make of Tractor	Men Replaced	Mules Replaced
Fordson	1.2	6.9
McCormick-Deering 10-20	1.5	7.1
McCormick-Deering 15-30	2.1	11.6
John Deere 15-27	1.8	9.1

This displacement applies to tractors operated normal working time each day. A few farmers in the area used their tractors day

and night for short periods to finish their land preparation and seeding.

For individual power units there is a dominant tendency for farmers to estimate the replacement higher, the larger the acreage of rice handled. Actually that is what happens when the better adjustment between power unit and acreage handled is attained. Yet between power units, the acreage handled for the same number of men and mules displaced varies widely. About the only way the farmer is able to judge this displacement is in terms of teams needed to handle his acreage, or the actual teams used before a tractor was purchased.

AVERAGE OUTLAY AND ACCOMPLISHMENT FOR TRACTORS

Outlay for the operation of a given make of tractor varies with the rate of accomplishment and mechanical condition of the machine. Again, the reader is cautioned against judging that a low cost of operation per day is most desirable. Frequently it is not, as in the case of larger tractors used for threshing purposes. Some farmers drive their tractors at a high rate of speed and accomplish more in a day. Other farmers do not get efficient operation even at a low daily fuel consumption. These individual variations need cause no alarm for they are to be expected and there is no way to eliminate them. Fuel outlays are influenced by the use of distillate instead of gasoline or kerosene. For 1929 the price of distillate was ten cents while gasoline was about sixteen cents per gallon. In the consumption of distillate the John Deere tractor is without doubt the most economical because of its mechanical construction.

Average outlay, as presented in Table X, does not include the wage of an operator. Regular hired men operate the tractor at the usual wage rate. Extreme items should be eliminated in arriving at averages. The satisfactory comparison is between outlays for a given amount of work. This is presented here as dollars for different expense items, and hours for time of work done. This may contain many misleading influences such as different prices for fuel, different working rates, and different mechanical condi-

TABLE X.

AVERAGE OUTLAY AND HOURS WORKED BY TRACTORS, EXCLUSIVE OF TRACTORS USED ON RELIFTS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Make of Tractor	Number of Tractors	Average Hours per Tractor	Outlay Per 10 Hours	
			Operating*	Overhead
Fordson	22	380	$5.38	$3.05
McCormick-Deering 10-20	27	625	4.16	3.66
McCormick-Deering 15-30	21	679	4.85	5.66
John Deere 15-27	34	708	4.44	4.20
Wallis†	11	531	5.26	6.87
Case†	8	514	9.13	7.85
Hart-Parr†	6	347	5.57	6.98
Rumley†	4	90	15.41	5.72

*Exclusive of operator.

†Includes all sizes and ages of tractors. Caution must be used when making comparisons between the last four groups of tractors and the others, because it was practically impossible to classify them for rating due to the small number in the total sample. However, many of these tractors were old and of a high rating and frequently not well suited to the size of farm. This accounts partly for the high outlays. Especially was this true for the Case tractors. Prospective tractor buyers should investigate carefully how the new models of these tractors are performing under rice farming conditions.

tions. Itemized statements are presented from which these averages were determined (Table XX to XXIII in Appendix A).

SPECIAL RICE EQUIPMENT

Grain drills, binders, and grain thresher are the most expensive items of machinery used in growing rice, other than power equipment. The grain drills have the fertilizer distributing attachment in most instances. Few farmers use a tractor for drawing the grain drill, though there is no special objection if a light tractor is available. Two types of grain binders are used; the power take-off binder, and the binder equipped to supply its own power by a bullwheel drive. The power take-off is an advantage in most seasons because the land gets mucky along the levees and causes considerable clogging unless continuous power can be supplied from the tractor to drive the binding mechanism. The power take-off binder costs about $325, or $50 more than the regular binder. Most of the threshing machines had either a twenty-eight or thirty-two inch cylinder.

The expected life of the items of equipment first mentioned depends upon service each year, power used to operate them, an-

nual repair outlay, and exposure during the idle season. With increasing age, the loss from exposure tends to increase and service actually rendered is reduced. Thus farmers find these tools giving different lengths of service. This variation is typical of the estimation from farmers interviewed in this study. The average expectation was about 1,500 acres for a drill, 1,200 acres for a binder, and 30,000 bags for a thresher. The additional annual repair charge was approximately $20 for a drill, $40 for a binder, and $60 for a thresher.

THE POWER UNIT AND LABOR INCOME

Acres of rice handled is probably the best single indicator of expected earning for the farm family. This discussion has indicated that the power unit tends to vary with acreage of rice. To bring before the reader the possibilities which the writers believe to exist between the power unit and the labor income, the following discussion is included. Labor income is used here to give a measure of the farmer's return for efforts put in, after allowance has been made for keeping his capital intact. It is over and above that labor furnished by family help. Out of this amount the farmer must make new additions to business, maintain his family, and secure self and family improvements if possible. This maximum expectation as an average labor income may be quite definitely fixed in the case of rice farming by the size of power unit operated and the acres of rice handled.

In order to show what the average labor income was for farms of different sizes and using particular power units, all the farms having a similar tractor, or without tractors, were studied. While the number of farms are limited yet there is little doubt about the general situation represented with respect to labor income. The farmer operating without a tractor has lower outlays for production and he gets a low income. His volume of business is too small. The Fordson operator gets a larger volume of business, but his outlays increase almost as rapidly as gross income. The farmers using a single McCormick-Deering 10-20 tractor had an average labor income of $1,339 in 1929. They handled an average of 45 acres more rice and secured $1,031 higher incomes than did

farmers operating with Fordsons. Farmers using a McCormick-Deering 15-30, or a John Deere 15-27 handled about fifty acres more rice and secured about $600 more labor income than did farmers operating with the smaller McCormick-Deering. The writers wish to emphasize the fact that a wide variation occurs and that farmers should realize this in trying to develop farm organizations that will return an amount sufficient to meet expectations possible with different power units in combination with given acreages of rice.

Not all organizations possess single power units like those just discussed. Some have more than one tractor and may include different makes. For the purpose of carrying out the same idea of expectation of income and volume of business done, more inclusive data are presented in Table XI. For this sample of farms the increase in labor income stopped at about 300 acres of rice and two tractors.

TABLE XI.

VARIATIONS IN LABOR INCOME AND ACRES OF RICE ACCORDING TO THE POWER UNIT USED, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Size of Power Unit	Number of Farms	Average Acres of Rice	Average Labor Income
No Tractor	9	73	$ 417
One Small Tractor	28	128	982
One Large Tractor	35	188	1,775
Two Tractors—Large, Small	17	285	2,441
Two Large Tractors	21	289	2,092
More than Two Tractors	11	253	1,794

FARM MOTOR TRUCKS

Motor trucks have completely replaced work stock in hauling rough rice from the farm to the mill or warehouse. Few farmers have warehouse space, except for their seed rice, so that all the rice must be delivered as soon as harvested. The purchase of a motor truck is primarily for rice hauling and finds supplementary use in other hauling work. Hauling by truck saves time, and outlays needed for feed, shoeing, and other work stock outlays. Truck operators and those farmers hiring contract trucks are generally

agreed that the savings due to trucks makes road hauling with mules a minor factor.

The adjustment problem with the individual farmer is one of choosing between hiring truck work done on a contract basis, and purchasing and operating his own truck. He is aided in arriving at a decision by considering outlays needed to own and operate a truck for the business which he has to do, and the contract outlays which he would have to make if he did not own a truck. This consideration extends even to the use of a car in the farm business. Some farmers completely replace the car for farm use by having a truck for all purposes, where previously the car had been used.

The chief operations performed by the truck are usually for the rice crop. Very few farmers do outside contract hauling, though some of them exchange with a neighbor. Sometimes a farmer will use his truck to haul tractor fuel and lubricating oil from market to the farm or from the farmstead to the section of the farm where it is needed. Most of the commercial oil companies operating in the rice area, however, deliver gasoline distillate, and lubricants to the farm for a very small additional charge.

There are many other tasks offering an opportunity to use the farm truck in addition to general business trips for the farmer. These consist of trips for seed and fertilizer for other crops, delivery of other crops to the market, hauling feed for livestock, and delivering livestock. These minor operations of the truck are comparatively insignificant in deciding on whether a truck should be purchased or not, but when a truck is added to the organization its use in diverse lines helps to add to the income prospects made possible by its investment.

An idea of the extent farmers have already placed trucks in their organization may be obtained from data presented in Table XII. Farms of 100 acres of rice or less are now using comparatively few trucks, which would seem to indicate that the hauling on farms of this size does not justify the investment in a truck. The proportion of farmers using trucks increased from 23 per cent on the smallest sized farms to 82 per cent on the largest sized farms. The ton and half truck was the maximum rating found. The optimum capacity for a farm truck is that sufficient to deliver

TABLE XII.

DISTRIBUTION OF MOTOR TRUCKS ON RICE FARMS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Acres of Rice	Number of Farms	Farms having Trucks	—Make and Rating of Trucks— Ford 1 Ton	Ford 1½ Ton	Chevrolet 1½ Ton
0-100	22	5	5	0	0
101-200	51	33	28	3	2
201-300	29	20	14	3	3
301-over	22	18	14	2	2

the rice to the warehouse about as rapidly as the capacity of the threshing outfit permits. Since rice hauling is usually given first importance in the consideration of a truck purchase, any capacity beyond that will probably be lost—a poor adjustment between the outlay for a truck and the volume of business for it to do. However, some farms have old trucks suitable for all jobs except heavy hauling.

The use of the truck in hauling rice to the shipping point or warehouse occupies sixty to seventy per cent of the truck use (Table XIII). Do not confuse the distribution of time on rice with total work done by trucks. Such details of time or mileage other than on the rice crop were not included in this study. However, total outlay for truck operation was obtained on the farms studied. Farmers not having trucks contracted to have their rice hauled to the warehouse. In 1929, of the total hours on rice, contract trucks performed 41.6 per cent in Acadia Parish, and 20.7 per cent in Jefferson Davis Parish. Hauling to market accounted for practically all of this.

Contract rice hauling is essential for many farmers. The contractors are in a position to move the rice quickly and, by getting a large volume, are able to get trucks with a capacity not possible by individual operators. The rate per bag varied from five cents to sixteen cents, depending on the length of haul and the kind of road. The most frequent rates were in the range of seven to ten cents. The average haul and the contract price per bag are given in Table XIV. It is necessary to remember that these data are for the specific farms studied. Most of these farms were located on or near gravel roads. For farms located farther from graveled roads the rates will be higher. There was little change in the contract rate as the distance increased from five to nine miles. Few farmers had over a nine-mile haul. While many

TABLE XIII.

PER CENT OF TIME BY OPERATIONS FOR OWNER OPERATED MOTOR TRUCKS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Operations	——Per cent of Time on Rice—— Acadia Parish	Jefferson Davis Parish
Haul Fertilizer and Seed	13.8	23.7
Haul Fuel	17.2	17.3
Haul to Market	69.0	59.0
Total	100.0	100.0

TABLE XIV.

VARIATIONS IN THE AVERAGE CONTRACT PRICE FOR RICE HAULING, ACCORDING TO DISTANCE FROM MARKET, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Miles to Market	Number of Farms	Average Miles Hauled	Average Contract Price per Bag
4 or less	34	2.8	$.07
5 to 7	21	5.4	.10
7 to 9	6	7.2	.11
9 and over	5	10.7	.16

farmers lived farther than that from their trading center, their rice was hauled to a convenient railroad loading station. As the size of farms increase, the average haul to market tends to increase. The farmers contracting to have their rice hauled lived nearer their market than did the average farmer operating a similar rice acreage and hauling with his own truck. Obviously, length of haul is a factor in determining whether the ownership of a truck is economical or not. The spread in prices between size groups is hardly comparable with differences in distances.

An attempt was made to determine from the practices of the farmers the relation of volume of hauling and distance from market to the practice of hauling their own rice. In the two larger sized groups of farms there is a marked increase in distance from market as well as in the average number of bags to be hauled, on farms where hauling was done with the farm truck. Actually this was an average of about two miles longer haul and 175 more bags of rice. The farmer who had a longer haul owned a truck rather than pay a nine or ten-cent charge per bag. With the smaller farmers it seems to be a matter of indifference in the choice. Those

hauling their own rice had slightly less to haul and were about the same distance from the market.

The average annual outlay for motor truck operation, exclusive of the driver, varied from $198 on farms having 100 acres or less of rice to $289 on farms having over 300 acres of rice. The chief difference in usage is in hauling seed rice, fertilizer, fuel, and market rice. On some farms the truck is used for all business errands instead of a car, or possibly no car is kept. In this study all the outlay for truck operation was considered a farm expense. A comparison is made here between the outlay for truck operation by farmers hauling their own rice to market and what the probable outlay for hauling market rice, seed, fuel, and fertilizer would be at contract rates. The contract hauler furnishes the truck operator. This item has not been included in the data on annual outlay. However, two men on the truck would represent an outlay of $4.00 per day, at 1929 harvest farm wage rates. This would mean at the maximum not over one and one-half cents per bag. From this data it appears that hauling over 2,100 bags at prevailing rates will about equal the annual outlay for the truck (Table XV). Less volume than this makes it necessary to use the truck for other crops and livestock needs.

TABLE XV.

ESTIMATED AVERAGE COST OF ROAD HAULING AT CONTRACT RATES AND OUTLAY FOR OWNER OPERATED TRUCKS, ACCORDING TO SIZE OF FARM, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Acres of Rice per Farm	Cost of Hauling at Contract Prices			Average Annual Outlay for Truck Operation*
	Rice	Seed, Fertilizer and Fuel	Total	
0-100	$ 56	$ 16.90	$ 72.90	$188
101-200	161	39.39	200.39	226
201-300	245	51.82	296.82	280
301-over	387	121.27	508.27	299

*Exclusive of truck driver.

The distribution of the annual outlay on farms by size groups is presented in Table XVI. The relative amount expended for the various items on farms of different sizes is fairly consistent.

Two-thirds of the total outlay is for current operating expenses, and the balance is for estimated value depreciation and interest foregone by having funds so invested.

TABLE XVI.

DISTRIBUTION OF ITEMS OF OUTLAY IN THE OPERATION OF FORD TRUCKS ON RICE FARMS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Items of Outlay	ACRES OF RICE PER FARM 0 to 100	101 to 200	201 to 300	301 and over
Gasoline	$44.05	$53.80	$62.10	$76.87
Lubricants	11.14	17.93	20.11	16.85
Repair Parts	15.00	29.00	23.74	41.78
Repair Labor	5.00	1.27	2.06	2.22
Tires and Tubes	41.40	33.69	41.39	43.06
License	15.00	15.00	15.00	15.00
Insurance	.00	1.46	1.00	.00
Sub Total	131.59	152.15	165.40	195.78
Depreciation	54.00	62.00	79.83	66.94
Interest	12.56	17.19	17.85	25.87
Total Outlay	$198.15	$231.34	$263.08	$288.59

AUTOMOBILES FOR FARM USE

Fifty per cent of the automobiles on rice farms used partly or entirely for farm business were Fords. Seventeen per cent were Chevrolets. Operators of small sized farms estimated that they used their automobile 97 per cent of the time for farm business. Operators of farms 101 acres of rice or more indicated about 90 per cent of the total time and outlay was for farm use. Automobiles which were used entirely for the family or personal use of the operator were excluded. The instances of such usage were chiefly in the group of farms of over 300 acres of rice. Seven of the farmers maintained more than one car for farm use. This practice is usually associated with higher total outlay for automobiles and a lower per cent of the outlay for farm use.

The items of outlay for automobile operation on rice farms of different sizes are presented in Table XVII. Total outlay increased rapidly between the farms having less than 101 acres of rice, and those having over 100 acres. Interplay between truck use and car use for farm business becomes significant on larger farms.

WORK STOCK

The most important need for work stock on all rice farms is in hauling bundle rice from the field to the threshing machine. If this operation could be avoided in rice farming, there is little doubt that practically all work stock would be eliminated. Since work stock must be kept for that particular task, the problem of the farmer becomes one of using it at as many other jobs as may be worth while. He considers the outlay for doing the job with teams versus the outlay for a tractor. The farmer will, in all probability, keep his investment in both, so that current operating outlays and rates of accomplishment are the factors to be judged.

Most farmers hire additional teams for threshing. All of the late rice threshing is done in a relatively short time so that little opportunity exists for exchanging team work. Especially is this true when a farmer is doing contract threshing. Only 25 per cent of the farmers exchanged all their team work. Forty-two per cent of the smallest farmers traded, and only 18 per cent of the largest farmers. The extra team work was hired at $3.50 or $4.00 per day for man, team, and wagon.

TABLE XVII.

OUTLAY PER FARM FOR AUTOMOBILE OPERATION ON RICE FARMS OF DIFFERENT SIZES, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Items of Outlay	ACRES OF RICE PER FARM			
	0 to 100	101 to 200	201 to 300	301 and over
Gasoline	$32.67	$73.04	$121.96	$113.50
Lubricants	10.61	17.64	22.87	19.72
Repair Parts	11.11	21.31	26.75	48.30
Repair Labor	.37	.46	.....	2.50
Tires and Tubes	23.06	40.80	42.40	18.20
License	15.93	17.20	18.46	15.00
Insurance	1.56	1.23	1.90	.....
Sub Total	95.31	171.68	234.34	217.22
Depreciation	57.25	101.37	128.75	83.60
Interest	18.58	29.90	30.04	28.55
Total Outlay	$171.14	$302.95	$393.13	$329.37

All of the farmers operating with only a Fordson did all or a part of their breaking with their teams. Many other farmers used teams for breaking the rice land because that operation comes at the time of year when the fresh rice stubble pasture is adequate to maintain the stock in good condition. Breaking is done in No-

vember and December so there is no rush to get the work done. Nearly all the farmers used work stock in drilling, usually because the tractors are busy just ahead of the drill, in discing and harrowing the land ready for seeding.

Over 90 per cent of the rice farmers purchased feed for work stock. This outlay averaged about $30 per head for all the farms. Home grown feeds which might have been sold or fed to other livestock on the farm amounted to $8.00 per head. The smallest farms had the lowest outlay for feed for work stock. The number of work stock kept increased less rapidly than acres of rice handled, so that the acres of rice per head increased from 15.2 on the smaller farms to 43.3 on the larger farms. Hours of work put in on rice increased from 361 per head to 531 on the same farms. Time put in by work stock on other things was not secured in this study. The acreage of other crops handled per head decreased as the acres of rice per farm increased. The smaller farms had an average of 4.5 acres of other crops per head and the larger farms 1.7 acres. Other crops included cotton, corn, soybeans, potatoes, and sweet potatoes. The practice among farmers who have croppers is to furnish each cropper with work stock for use throughout the crop season, so that a few head handle all the other crop work rather than all the work stock kept. Comparative data of a general nature are presented in Table XVIII.

The replacement factor is largely of historical significance to most farmers for the burden of work stock now kept is negligible

TABLE XVIII.

OUTLAY AND ACCOMPLISHMENT FOR WORK STOCK ON RICE FARMS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Acres of Rice per Farm	Average Number of Head	Net Depreciation per Head	Feed Per Head — Purchased, Dollars	Feed Per Head — Home Grown,$*	Acres of Rice per Head	Acres Other Crops per Head
0-100	5.3	$10	$21	$ 5	15.2	4.3
101-200	5.4	7	34	8	32.9	3.3
201-300	8.8	3	32	8	33.3	2.3
301-over	10.0	2	30	10	43.3	2.7

*Does not include rice stubble pasture and rice straw.

in the operation of their businesses. It is highly improbable that they will increase their work stock in the near future, at present prices for mechanical power, and operating outlays such as fuel and oil, and wages. However, for that group of farmers where

no tractors are owned there is a possibility that comparisons will be significant for their future action. This comparison for farmers operating 0-100 acres of rice is presented in Table XIX. These data present the picture accurately, it is believed.

LABOR AND POWER REQUIREMENTS

The labor and power operations usually performed in producing rice have been grouped under four headings. These have been designated land preparation, seeding, growing, and harvesting. Land preparation consists chiefly of breaking the land, discing, and harrowing. Other minor preparation operations prior to seeding are draining and levee construction. Seeding includes the operation of seed cleaning and hauling, fertilizer hauling, drilling, and a few minor tasks performed after drilling and before the levees are closed for flooding. The requirements for growing include the operations of closing levees, walking levees, pumping, hauling fuel, weeding, and draining. Harvesting consists of the operations of cutting the swath, tieing, binding, shocking, and threshing. The usual order in which the operations occur, and the average hours for the 1929 crop are presented for farms of different sizes in Appendix D, Table XXVII.

TABLE XIX.

VARIATIONS BETWEEN OUTLAY AND ACCOMPLISHMENT FOR WORK STOCK ON FARMS HAVING 100 ACRES OF RICE OR LESS OPERATED WITH A TRACTOR, AND WITHOUT A TRACTOR, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Items of Comparison	Farms operated with a Tractor	Farms operated without a Tractor
Average Number of Work Stock	5.0	6.2
Investment per Head in Work Stock	$68.00	$104.00
Depreciation per Head	$ 7.00	$22.00
Outlay for Purchased Feed per Head	$22.00	$21.00
Outlay in Home Grown Feed per Head	$6.00	$2.00
Acres of Rice per Farm	82.00	60.00
Acres of Rice per Head	17.30	10.00
Acres of Other Crops per Farm	5.20	2.70
Hours per Head on Rice	346.00	416.00

Some economies in labor and power are possible with larger acreages of rice. The most important savings appear in man labor for pumping, levee construction and supervision, and discing and harrowing. Variations occur due to soil and weather conditions,

the topography and frequency of levees, the working rate of the power unit, and the time pressure for completing certain operations. Man labor is increased rapidly when horses are used instead of a tractor. Some individuals prefer to get their seed bed in better condition than others. Some farmers fail to keep subsequent operations together and find that they have to repeat these because of weather interference. Such variations are accepted as normal expectations and practically impossible to eliminate. The reader is cautioned against assuming fixed labor and power requirements. There may be many requirements which will result in a specific production.

A comparison has been made between single power units performing the same task. This represents as nearly comparable items as the data afforded. These comparisons have a worthwhile significance, if the supplementary information of individual farmers making up the compared groups is at hand. These data are presented in Appendix D, Tables XXX to XXXIII.

STATISTICAL APPENDIX

Much intermediate and general data were developed in the process of securing the specific data presented in the preceding discussion. It has been purposely intended to avoid placing excessive tabular material before the reader. But those especially interested in this subject may desire to get additional information from the original source material. The fundamental basis data are presented in Tables XX to XXXIII. It is the desire of the writers to make the comparative data available for the farmers who furnished it. It is believed that some facts are presented which will help farmers to act more quickly and judge more wisely in handling their power problems.

APPENDIX A—TRACTOR STATISTICS

TABLE XX.

REQUIREMENTS PER TEN HOURS FOR FORDSON TRACTORS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Farm No.	Hours Worked	Repairs	Fuel and Oils	OUTLAY, DOLLARS		
				Operating	Overhead	Total
48	100	$.50	$5.15	$5.65	$7.20	$12.85
60	100	1.10	3.07	4.17	8.60	12.77
60	100	1.10	3.07	4.17	5.60	9.77
33	100	.....	3.08	3.08	5.80	8.88
49A	110	4.55	3.73	8.28	2.73	11.01
6	149	.47	2.28	4.36	7.51	11.87
38A	171	2.92	4.68	9.06	3.13	12.19
12	205	.....	4.27	6.71	3.92	10.63
41	230	6.52	3.56	10.08	.35	10.43
37A	250	2.70	3.65	6.35	2.40	8.75
52	349	.43	2.59	3.31	5.48	8.79
8	350	1.71	3.64	7.06	3.79	10.85
19	463	1.08	2.79	4.41	.....	4.41
59	483	1.15	2.42	3.57	2.36	5.93
14	530	4.90	1.78	6.68	.11	6.79
13	568	.18	2.16	2.34	1.48	3.82
16	570	.70	2.02	2.72	1.71	4.43
5A	592	2.36	2.97	5.51	2.02	7.53
17*	680	1.23	3.07	5.53	.96	6.49
39	889	1.69	2.12	4.15	.06	4.21

*Average for three tractors.

TABLE XXI.

REQUIREMENTS PER TEN HOURS FOR McCORMICK-DEERING 10-20 TRACTORS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Farm No.	Hours Worked	Repairs	Fuel and Oils	OUTLAY, DOLLARS		
				Operating	Overhead	Total
63	275	$.....	$3.76	$3.76	$8.73	$12.49
7	317	4.89	3.81	8.36	5.80	14.16
10A	367	1.09	3.75	4.84	2.81	7.65
53	385	2.34	4.16	6.50	4.99	11.49
53	385	3.90	4.16	8.06	4.27	12.33
20A	405	.....	3.12	3.12	5.73	8.85
6A	408	1.47	5.09	6.81	4.51	11.32
55	469	.64	3.63	4.48	4.13	8.61
15	484	.08	1.87	1.95	3.50	5.45
32	491	1.53	2.42	3.95	2.73	6.68
55A	514	.74	1.89	2.63	4.66	7.29
53A	592	2.15	2.49	4.94	2.87	7.81
58	612	1.06	3.29	4.35	2.36	6.71
50A	617	2.03	3.24	4.43	.52	4.95
30A	638	.....	3.48	3.48	3.84	7.32
45*	658	1.90	2.30	4.20	3.28	7.48
40	715	.03	2.41	2.44	3.91	6.35
16A	727	1.03	2.55	3.75	2.25	6.00
1	761	.....	4.05	4.05	3.94	7.99
35A	785	.38	2.65	3.08	1.63	4.71
3A	850	.....	2.07	2.07	4.24	6.31
47A	855	.....	1.94	1.94	5.33	7.27
48A	878	1.14	3.01	4.15	3.32	7.47
21A	916	1.64	1.76	3.62	1.96	5.58
12A	1049	.24	1.92	2.21	.35	2.56
60A	1055	.99	2.69	3.68	1.61	5.29
22A	1065	.23	3.15	3.43	2.54	5.97

*Average for two tractors.

TABLE XXII.

REQUIREMENTS PER TEN HOURS FOR McCORMICK-DEERING 15-30 TRACTORS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Farm No.	Hours Worked	Repairs	Fuel and Oils	——OUTLAY, DOLLARS—— Operating	Overhead	Total
64	140	$.....	$2.43	$2.43	$19.11	$21.54
23A	153	.....	4.38	4.38	19.87	24.25
36	230	.....	3.69	3.69	21.74	25.43
11A	530	.....	5.35	5.35	6.44	11.79
56	568	.....	4.48	4.48	3.79	8.27
49A	590	2.54	4.24	6.78	4.58	11.36
57	614	3.26	5.28	8.54	4.38	12.92
36A	624	2.54	2.75	4.24	1.97	6.21
59A	666	.09	2.47	3.32	2.94	6.26
59A	666	.09	2.47	3.32	2.94	6.26
42A	667	.37	6.08	6.45	4.20	10.65
57A	696	3.59	3.33	6.92	.35	7.27
48	731	.88	3.14	4.02	3.67	7.69
48	731	.73	3.14	3.87	3.67	7.54
10	740	.68	4.32	5.00	1.35	6.35
13A	760	.20	6.49	6.69	3.58	10.27
23A	760	1.97	5.27	7.24	3.95	11.19
1	761	.....	4.05	4.05	3.94	7.99
38	792	.02	6.75	6.79	3.98	10.77
16A	838	.24	2.74	3.04	1.96	5.00
60A	1055	1.43	3.52	4.95	.....	4.95
31A	1067	.....	2.75	2.75	3.75	6.50
15A	1135	.....	4.77	4.77	4.37	9.14
37	1668	.04	3.36	3.40	1.30	4.70

TABLE XXIII.

REQUIREMENTS PER TEN HOURS FOR JOHN DEERE 15-27 TRACTORS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Farm No.	Hours Worked	Repairs	Fuel and Oils	OUTLAY, DOLLARS		
				Operating	Overhead	Total
8	150	$.....	$2.84	$2.84	$13.33	$16.17
24	274	.....	5.03	5.03	13.72	18.75
56A	358	2.88	3.75	7.99	5.56	13.55
19A	396	.....	2.96	2.96	5.09	8.05
7A	410	.98	4.18	5.53	4.59	10.12
11A	411	3.65	5.29	9.67	6.23	15.90
52A	416	1.69	2.25	3.94	5.77	9.71
61	426	.....	2.70	2.70	6.43	9.13
28A	454	.11	4.04	4.15	8.63	12.78
2A	507	1.48	3.28	4.76	5.56	10.32
18A	560	4.11	5.25	9.36	.50	9.86
33	560	.89	2.01	2.90	3.78	6.68
26A	585	.02	3.39	3.41	3.38	6.79
2A	587	.30	3.25	3.67	5.21	8.88
25A	591	1.86	3.37	5.23	2.91	8.14
43A	640	.63	2.90	3.53	3.19	6.72
23	652	.63	4.62	5.28	3.80	9.08
32A	669	1.39	1.68	3.07	2.66	5.73
9A	705	.17	5.47	5.64	2.30	7.94
20	720	.....	2.67	2.67	4.15	6.82
27A	757	.....	2.51	2.51	2.70	5.21
64	782	1.28	2.13	3.41	3.27	6.68
42A	787	.64	5.98	6.62	2.49	9.11
57A	823	1.82	2.95	4.77	1.85	6.62
44A	847	.....	3.49	3.49	4.17	7.66
41A	873	.04	6.74	6.78	2.43	9.21
51	947	.....	3.95	4.27	2.98	7.25
46A	1084	2.31	2.39	4.70	1.66	6.36
17A	1093	.....	3.27	3.27	3.65	6.92
48A	1095	.95	2.99	3.94	2.63	6.57
37A	1180	.03	2.30	2.72	2.03	4.75
46A	1204	2.08	2.45	4.53	1.49	6.02
58A	1226	.08	1.98	2.06	2.22	4.28
24	1310	.57	3.01	3.67	2.52	6.19
49	1511	.40	2.19	2.69	1.93	4.62

APPENDIX B—MOTOR TRUCK STATISTICS

TABLE XXIV.

PER CENT DISTRIBUTION OF ITEMS OF OUTLAY FOR FORD TRUCK OPERATION ON RICE FARMS, BY SIZE OF FARM, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Items of Outlay	ACRES OF RICE PER FARM			
	0 to 100	101 to 200	201 to 300	301 and over
Gasoline	22.24	23.26	23.61	26.64
Lubricants	5.62	7.75	7.64	5.84
Tires and Tubes	20.89	14.56	15.74	14.92
Repair Parts	7.57	12.54	9.02	14.47
Repair Labor	2.52	.55	.78	.77
License	7.57	6.48	5.70	5.20
Insurance	.00	.63	.38	.00
Sub-Total	66.41	65.77	62.87	67.84
Depreciation	27.25	26.80	30.34	23.20
Interest	6.34	7.43	6.79	8.96
Total	100.00	100.00	100.00	100.00

TABLE XXV.

COMPARISON OF THE USE OF CONTRACT TRUCKS AND OWNED TRUCKS ON RICE FARMS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Acres of Rice per Farm	Contract Haul			Own Haul	
	Average Miles to Market	Average Bags per Farm	Average Price per Bag	Average Miles to Market	Average Bags per Farm
0-100	4.2	749	$.08	4.8	710
101-200	5.2	1704	.09	4.7	1688
201-300	3.3	2501	.09	5.5	2723
301-over	4.5	3745	.10	6.2	3878

APPENDIX C—AUTOMOBILE STATISTICS

TABLE XXVI.

PERCENTAGE DISTRIBUTION OF OUTLAY ITEMS PER FARM FOR AUTOMOBILE OPERATION ON RICE FARMS OF DIFFERENT SIZES, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Items of Outlay	ACRES OF RICE PER FARM			
	0 to 100	101 to 200	201 to 300	301 and over
Gasoline	19.09	24.11	31.02	34.46
Lubricants	6.20	5.82	5.82	5.99
Repair Parts	6.49	7.03	6.80	14.66
Repair Labor	.22	.15	.....	.76
Tires and Tubes	13.47	13.47	10.79	5.53
License	9.31	5.68	4.70	4.55
Insurance	.91	.41	.48	.....
Sub-Total	55.69	56.67	59.61	65.95
Depreciation	33.45	33.46	32.75	25.38
Interest	10.86	9.87	7.64	8.67
Total Outlay	100.00	100.00	100.00	100.00

TABLE XXVII.

AVERAGE LABOR AND POWER REQUIREMENTS BY OPERATION FOR 100 ACRES OF RICE, ACCORDING TO SIZE OF FARM, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

OPERATION	SIZE OF FARM															
	0–100 ACRES				101–200 ACRES				201–300 ACRES				301–OVER ACRES			
	Man Hours	Horse Hours	Tractor Hours	Truck Hours	Man Hours	Horse Hours	Tractor Hours	Truck Hours	Man Hours	Horse Hours	Tractor Hours	Truck Hours	Man Hours	Horse Hours	Tractor Hours	Truck Hours
Cleaning ditches	23	4	..	..	35	8	1	..	11	..	2	..	22	2	..	..
Breaking	268	778	42	..	141	210	87	..	148	189	97	..	172	293	99	..
Levee construction	23	46	4	..	29	18	12	..	23	7	10	..	17	..	9	..
Draining	38	81	..	..	20	37	..	..	32	59	..	..	30	66	..	..
Discing and harrowing	323	356	192	..	184	110	154	..	179	12	176	..	150	34	141	..
TOTAL PREPARATION	675	1265	238	..	409	383	254	..	393	267	285	..	391	395	249	..
Haul fertilizer	1	3	..	..	9	4	..	6	9	7	..	5	9	..	..	8
Haul and clean seed	16	19	..	4	16	13	1	6	11	3	1	5	15	..	3	7
Seeding	92	367	..	..	85	310	8	..	84	310	5	..	77	307	..	..
Harrow and drag	12	40	2	..	7	12	4	..	3	6	2	..	..	..	..	..
Levee construction	69	71	20	..	49	45	21	..	64	47	24	..	54	37	22	..
Draining	27	44	3	..	15	27	..	..	25	45	..	..	25	32	..	..
TOTAL SEEDING	217	544	25	4	181	411	34	12	196	418	32	10	180	376	25	15
Close levees	90	..	..	..	58	8	..	..	67	15	..	..	61	..	..	..
Levee walking	897	..	..	..	530	..	..	..	486	..	..	..	392	..	..	..
Weeding	292	..	..	..	208	..	..	..	249	..	..	..	261	..	..	..
Draining	100	..	..	..	56	..		..	57	..	..	..	50	..	..	..
TOTAL GROWING—No Diesel Engine	1379	..	..	..	852	8	..	..	859	15	..	..	764	..	..	..
Close levees	86	..	14	..	71	6	..	..	81	9	..	..	58	10	..	..
Levee walking	545	..	..	..	586	..	..	..	430	..	..	..	323	..	..	..
Run engine or haul fuel	505	29	..	18	908	201	21	19	734	5	31	14	516	..	..	30
Weeding	469	..	..	..	275	..	..	..	264	..	..	..	141	..	..	..
Draining	69	..	..	..	80	..	..	..	66	..	..	..	54	..	..	..
TOTAL GROWING—Diesel Engine	1674	29	14	18	1920	207	21	19	1575	14	31	14	1092	10	..	30
Cut swath and tie	45	..	..	..	31	..	..	..	38	..	..	..	19	..	..	..
Binding	209	171	81	..	168	9	82	..	176	24	86	..	178	18	79	..
Shock	346	..	..	..	313	..	..	..	347	..	..	..	330	..	..	..
Pitch	162	..	..	..	174	..	..	..	181	..	..	..	167	..	..	..
Haul to thresh	312	618	..	..	341	682	..	..	352	699	..	..	329	645	7	..
Thresh	58	..	39	..	65	..	38	..	57	..	40	..	55	..	33	..
Sew	33	..	..	..	37	..	..	..	38	..	..	..	33	..	..	..
Drag and clean	65	..	..	..	75	..	..	..	79	..	..	..	67	..	..	..
Haul to market	72	..	..	52	88	..	..	55	90	..	..	52	88	..	..	48
TOTAL HARVESTING	1302	789	120	52	1292	691	120	55	1358	723	126	52	1266	663	119	48
TOTAL—Using Diesel Engine	3868	2627	397	74	3802	1692	429	86	3522	1422	474	76	2929	1444	393	93
TOTAL—Not Using Diesel Eng.	3573	2598	383	56	2734	1493	408	67	2806	1423	443	62	2601	1434	393	63
ACRES	1,513				6,966				5,332				5,533			

TABLE XXVIII.

TOTAL LABOR ON RICE ON FARMS HAVING DIFFERENT POWER UNITS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Power Unit	Number of Farms	Hours per 100 Acres of Rice			
		Man	Horse	Tractor	Truck
No Tractor	7	3403	4524	82	29
Fordson	10	4095	2905	545	97
McCormick-Deering 10-20	15	3161	1732	450	63
McCormick-Deering 15-30	7	3290	1665	415	68
John Deere 15-27	16	3002	1324	387	79
Other Tractors	7	2694	1483	539	76

TABLE XXIX.

TOTAL LAND PREPARATION LABOR ON FARMS USING DIFFERENT POWER UNITS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Power Unit*	Number of Farms	Hours of Labor per 100 Acres of Rice		
		Man	Horse	Tractor
No Tractor	7	773	2715	37
Fordson	10	764	1539	331
McCormick-Deering 10-20	15	408	380	271
McCormick-Deering 15-30	7	379	269	246
John Deere 15-27	16	377	264	242
Other Tractors	7	391	420	243

*Refers to one tractor of the specified make and rating.

TABLE XXX.

LABOR REQUIREMENTS FOR BREAKING RICE LAND IN ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Power Unit*	Number of Farms	Average Acreage of Rice	—Hours per 100 Acres—		
			Man	Horse	Tractor
Team Only	7	73	268	1000	....
Fordson	10	100	231	793	38
McCormick-Deering 10-20	15	130	163	279	92
McCormick-Deering 15-30	8	194	146	200	94
John Deere 15-27	16	190	137	193	87
Other Tractors	7	139	153	307	75

*Refers to 3 or 4-horse hitch, or one tractor of the make and rating given.

TABLE XXXI.

LABOR REQUIREMENTS FOR HARROWING AND DISCING ON RICE FARMS, ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Power Unit*	Number of Farms	Acreage of Rice	Hours per 100 Acres		
			Man	Horse	Tractor
No Tractor	7	73	424	1527	37
Fordson	10	100	439	614	286
McCormick-Deering 10-20	15	130	182	62	166
McCormick-Deering 15-30	8	194	151	.....	150
John Deere 15-27	16	190	167	15	162
Other Tractors	7	139	187	76	167

*Refers to 3 or 4-horse hitch, or one tractor of the make and rating given.

TABLE XXXII.

LABOR REQUIREMENTS FOR DRILLING RICE ON FARMS IN ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Power Unit*	Number of Farms	Acreage of Rice	Hours per 100 Acres		
			Man	Horse	Tractor
No Tractor	7	73	90	361	.....
Fordson	10	100	116	463	.....
McCormick-Deering 10-20	15	130	88	335	3
McCormick-Deering 15-30	8	194	90	339	.....
John Deere 15-27	16	190	82	325	.....
Other Tractors	7	139	82	326	.....

*Refers to 3 or 4-horse hitch, or one tractor of the make and rating given.

TABLE XXXIII.

LABOR REQUIREMENTS FOR CUTTING RICE ON FARMS IN ACADIA AND JEFFERSON DAVIS PARISHES, 1929.

Power Unit*	Number of Farms	Average Acreage of Rice	Hours per 100 Acres		
			Man	Horse	Tractor
Teams Only	7	73	144	475	11
Fordson	10	100	292	119	131
McCormick-Deering 10-20	15	128	180	.....	89
McCormick-Deering 15-30	8	194	166	34	79
John Deere 15-27	16	190	161	14	76
Other Tractors	7	139	166	.....	83

*Refers to 3 or 4-horse hitch, or one tractor of the make and rating given.